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*James H. Miller
from Mr. Bunker
10-11-1864*

REPORT

ON THE PROPERTY OF THE

Westmoreland Petroleum Co.

OF

NEW BRUNSWICK,

April 25th, 1864.

BY

DR. HERBERT W. C. TWEDDLE,

Manager of the Standard Petroleum Refining Works, Pittsburgh, Penn'a.

PITTSBURGH:

PRINTED BY W. S. HAVEN, CORNER OF WOOD AND THIRD STREETS.

1864.

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REPORT

ON THE

Oil and Burning Springs of the Parish of Dorchester,

WESTMORELAND CO., NEW BRUNSWICK,

BY

DR. HERBERT W. C. TWEDDLE,

Manager of the Standard Petroleum Refinery Pittsburgh, Pa.

PITTSBURGH, PENN'A.,

April 25th, 1864.

MARQUIS DE LOUSADA,

H. B. M. Consul, Boston, Mass.

MY DEAR SIR:

Last November, in accordance with your request to send a practical oil well borer, to examine and bore for petroleum on the property which you had leased for that purpose in Westmoreland County, New Brunswick, on account of the numerous oil and burning springs which existed there, I selected Mr. Alfred Shutterly, who had been engaged in boring wells for two years previous on Oil Creek, Venango County, in this State, and who, from his practical experience and mechanical abilities, was well adapted to prosecute the search for oil.

He left Pittsburgh the same month, supplied with boring tools, &c. On arriving there he examined thoroughly the surface indications pointed out to him, and after prospecting the surrounding neighborhood, he selected a locality to bore, a few yards from an oil spring long known to exist, and situated on the line of the farms of John, Loraut, and Raphael Como, and that of James Powell, at

the head of a ravine, which point is about three-quarters of a mile from the Petticodiac river, and 150 to 200 feet above its high water level.

The diameter of the well boring is $4\frac{1}{2}$ inches, and from time to time its progress was reported, and a memorandum kept of the different strata penetrated. In consequence of the lateness of the season, the severity of the weather, and the double duty which devolved on Mr. Shutterly, owing to the want of experienced assistants, the progress was rather slow. I was frequently importuned in his letters to come and see the place personally, for he felt assured, from the great similarity of the country to that of the oil producing regions of Pennsylvania and Virginia, and from numerous surface indications, and burning springs existing, that it only required development to constitute one of the most valuable oil producing territories.

Our extensive refining business requiring my constant attention, I could not comply with his request at that time, much as I wished to investigate for myself. In the latter part of March, Mr. Shutterly presented himself unexpectedly at my house, and persuaded me to return with him and make a personal examination of the country. Convinced by his earnestness, I was induced to accompany him, and leaving Pittsburgh on the 2d of April, arrived at St. John, N. B., on the 6th inst. On the 8th inst. we left via rail for Monckton, at the bend of the Petticodiac, some 90 miles distant; there I had the pleasure of meeting Mr. Alexander Wright, who being largely engaged in shipbuilding and an old resident, was well acquainted with the vicinity. The same evening we drove down to Dover, a distance of 12 miles, finding myself transported from almost summer weather to midwinter, the ground still being frozen and partially covered with snow.

Previous to leaving Boston, I learned from you that Professor Charles Jackson (whose opinion commands, both as a geologist and a chemist, the highest respect of the scientific world) had stated in

his Geological Report of New Brunswick and Nova Scotia that in time this region would, if developed, be productive of petroleum. The professor's absence from home prevented my seeing him ; but though somewhat skeptical as to its existence, I became ultimately convinced of the accuracy of his conclusions ; and his prediction is now verified, for I have before me several gallons of petroleum which I collected there myself. Some of this oil I have distilled and refined. The per centage of illuminating oil obtained is larger than what we get from our Pennsylvania or Virginia petroleum, inasmuch as it contains but little benzole, and the odor is more agreeable.

On the first day after my arrival, I visited the well, and found they had bored to the depth of 316 feet, working then in a black compact shale, specimens of which you have. When the sand pump was used the water came up, bubbling and foaming as if the gas was absorbed or rather compressed into it under a great pressure, and when ignited, gave out a long lambent flame, which burned for some time. It was unquestionably the regular gas indicative of the immediate proximity of petroleum, which subsequently proved to be the case. A few days previously the well had been very salt, and the water still retained a brackish taste.

A few feet from the derrick-house the surface indications previously mentioned were still exhibited. On breaking the ground under the side of the bank from which the spring issued, much to my delight and surprise, quite a considerable amount of oil came floating out on the surface of the water, like a large leak from a bulk boat loaded with oil.

We employed men to excavate further ; in a few hours they made quite a large opening, and exposed the strata from which the oil issued, being a thin gravel bed, lying in a compact light blue clay. The rock is a few feet below, as will be seen from the accompanying diagram of the well, showing pretty accurately the rock perforated whilst drilling. You will observe, that about 40 to 50 feet from

the top was the first show of oil, and after passing through several veins at 90 feet, had a very excellent show, the rope being continually soaked with oil, and bringing up quantities in the sand pump at this depth. Mr. Shutterly would have tubed the well had tubing been on the ground, and he has no doubt but it would even then have been a good pumping well. At about 200 feet, the sand pump brought up pieces of copper-bearing rock, and the tools became coated with metallic copper.* It was undoubtedly sulphuret. When I left, the well was at a depth of 330 feet, and the gas was very strong, boiling the water over the top of the well, and small quantities of oil showed itself. They had just passed through the shale into the second strata of sand-stone rock, and were progressing at an average of about eight feet per day. Some times whilst boring the tools would strike crevices, and the water in the well would be spurted up by the force of the gas into the derrick-house.

Within 60 yards of the well another oil spring exists. The earth is evidently saturated with petroleum, which by exposure to the air has made it tough and black, bearing strong resemblance to asphaltum.

During the interval occupied by the men excavating the spring, we visited another branch of the ravine about half a mile distant, running north and south, and found the rocks exposed to view lying at an angle of about 15° , with a dip from N. E. to S. W. They were a shale rapidly disintegrating by exposure, and very rich in oil—readily igniting when exposed to a flame.† In this ravine were several surface indications, and at one point where the stream was not frozen over, particles of oil were frozen

* Copper mines are about being worked to a considerable extent a few miles from this point, in Albert county, at Salmon river (called the Williams Copper Company). The county is highly volcanic. From the main shaft about 100 tons of ore, gray sulphurets, have been taken out, yielding 28 per cent. to 30 per cent. of copper. The lodes bear north towards the point of your operations.

† This is a shale somewhat similar to that found at Baltimore, Albert county, and will yield by distillation about 50 to 60 gallons of oil per ton, by actual test—the oil being of superior quality for illuminating purposes.

up in pieces of ice. This stream debouches into the Petitcodiac river, within the southern boundary of your property.

I also examined on a farm adjoining, about 200 yards from the river, a large trench which had been excavated a few years ago whilst searching for Albertite coal, about 200 yards from the river. One of the proprietors stated that when they exposed the rock it was found hove up like the roof of a house, and they bored down with hand tools to a depth of 60 feet, when they struck a spring of water and oil. Coal not being found they discontinued their search. The oil flowed about a barrel daily for a long time and still flows; at the time of my visit it was frozen up, but Mr. Shutterly saw it flow when he first arrived there. Good surface indications are also found a short distance from this place, the oil oozing out of fissures in the rock.

The second day I drove over to Memramcook, and on the way stopped at a farm where a gentleman from Pennsylvania discovered oil on a stream flowing through your property. By stirring the bed of the stream, oil plainly exhibited itself on the surface, and spread out in its beautiful iridescent colors.

At J. Goodie's farm we found the extensive deposit of maltha, or in other words, earth and vegetable matter, saturated with petroleum, which has become oxidized, and is similar to that found on the Powell farm. One anticlinal line runs through this portion of property.

At Bishop's a burning spring has been known to exist for some time; in several places in that vicinity oil indications occur. The pastor of the parish, Father La France—by whom I was very kindly received—gave me some valuable information, and told me of several places in the neighborhood where surface indications of oil existed.

On the following day we examined the land around the lower leases at Bellevue, and found various promising localities. The country around this portion shows evidence of very great disturbance, the rocks being much dislocated.

The remainder of my stay was devoted to examining the other portions of the property embraced by your leases, and the surrounding country. The general similarity of the country to the oil regions of Pennsylvania and Virginia, and of the rocks perforated during boring—while the surface indications are equal if not superior to those exhibiting themselves there, previous to the discovery of petroleum in large quantities—convince me that this property only requires the necessary outlay for boring to render it highly productive, not only for petroleum, but of minerals. Albertainite has been found permeating the rocks in several places.

The proximity of this property to the seaboard, enables vessels of 500 tons to load the product within a mile and a half of any portion of it, thus saving all the expense and loss incident to land transportation. As oil can be conveyed through pipes to the water's edge, access can be had to it at all seasons of the year, the tides rising from 40 to 50 feet, and washing the property for five or six miles on both sides. It is thus rendered more valuable by giving it this great advantage over wells in the interior of the country, where the expense of land carriage to the place of shipment is frequently more than the first value of the product. Here the oil can be placed on board bulk vessels through pipes, thus saving all charge for barrels and handling.

Labor can be obtained here in abundance and at very cheap rates, Mr. Shutterly only paying from 60 to 70 cents per day, in New Brunswick currency. Lumber is plentiful and low in price. Sawed boards are \$6 to \$7 per M.; and engines, boilers and tools can be obtained at reasonable rates.

Large numbers of first class vessels, from 300 to 3000 tons burden, are built all along the seaboard, and are sent for sale principally to England. Freights to Europe would be low, as cargoes are always in demand.

The Government of the Province is most liberal in its policy, and its Assembly annually offers inducements for capitalists to develop its resources, which have been hitherto neglected.

I omitted to mention that during the winter Mr. Shutterly had erected several derricks, and had several hundred cords of wood hauled and stacked at the different points where he thought it would be advisable to bore during the coming season.

At one point where he had erected a derrick, he had made an excavation down to the rock, about 12 feet deep; this contained water, on the top of which was some oil. The vicinity where he was excavating was strongly impregnated with the odor of petroleum. I may say the same of many places in the locality. Several barrels of oil were sent to England last year, and was considered to be of superior quality.

I cannot close this communication without expressing the great pleasure I derived from making the acquaintance of Edward Allison, Esq. of St. John, and Alexander Wright, Esq. of Salisbury, through the medium of your letters of introduction. Both these gentlemen are intimately acquainted with the geology of the province, and have taken much interest in the development of its mineral resources. Mr. Wright, who from his long residence is thoroughly familiar with the country, and its habitants, who are nearly all French, became my guide and companion, devoting several days in accompanying me, and imparting such information as he was possessed of in relation to the object of my visit.

I regret much that I could not afford the time to examine more leisurely this country, which is so rich in minerals, but trust to be able to return again during the present summer.

Before leaving I indicated to Mr. Shutterly the various points where to prepare to prosecute further operations.

With the highest regards,

I remain Yours, sincerely,

HERBERT W. C. TWEDDLE.

EXTRACTS AND MEMORANDA

RELATING TO THE WESTMORELAND CO'S. PROPERTY.

1. In Professor A. C. Taylor's standard work, called "Statistics of Coal," (see map, page 156,) this part of Westmoreland is placed in the centre of a vast coal field. The existence therefore of petroleum oil, which probably is a natural distillation of the coal, would be not unexpected by geologists.

2. In Mr. Perley's "Hand Book of New Brunswick," page 34, it says: "Carboniferous rocks or *coal measures* cover the most considerable portion of Westmoreland county;" and at page 36, "A highly bituminous mineral has been found near the Petitcodiac river" (which bounds the Company's property on one side). "A scientific dispute has arisen as to its character—some call it 'pitch coal'—and from it are distilled various liquid oils, &c.;" and on page 39, "Bituminous shale is found in abundance near Dorchester in Westmoreland, and throughout a large district in that vicinity. This shale is highly charged with bitumen; and from it naptha is distilled, also a new liquid 'hydro-carbon,' which has been designated kerosene. Liquid bitumen also, or naptha in its natural state, has been found flowing from this shale in several places."

3. Professor C. T. Jackson, of Boston, perhaps the most distinguished geological chemist of the day, says he has always pointed out this precise locality as that where (deducing his reasons from geological data only,) petroleum *ought* to be found in abundance.

When I showed this learned professor the samples of peat and of liquid unctuous matter, he at once pronounced them petroleum, and advised an energetic *prosecution* of the undertaking. Samples also of the shale were submitted to the professor, and analyzed by him; he writes to Her Britannic Majesty's Consul at Boston:

"DEAR SIR:—I find the New Brunswick shale you brought me yields per cent.

Volatile matter,	-	-	-	-	-	-	85.0
Fixed carbon,	-	-	-	-	-	-	9.8
Slated matter or ash,	-	-	-	-	-	-	55.7
							<hr/>
							100.0

I think you may depend on a yield of about 50 gallons of pure burning oil from a ton of this slate. The quality of the oil will be good, since there is so little carbon in the form of coal.

Respectfully,

Your obedient servant,

(Signed,)

C. T. JACKSON."

4. Professor Simmonds, reporting on some neighboring property, incidentally observes: "In connexion with this locality there are petroleum springs, from which a tarry substance is exuded and incorporated with the surrounding clay; it is plastic and inflammable, burning with a brilliant flame. There can be no doubt of petroleum in quantity being in this vicinity and inviting exploration. I shall not be surprised if at no distant day, the oil wells of Pennsylvania be found to prevail on the banks of the Petitcodiac, New Brunswick"—thus endorsing the predictions of Dr. Robb, formerly Provincial Geologist and Professor of Chemistry at the University of New Brunswick.

Professor W. F. Roberts, of Philadelphia, fully concurs in this opinion. He no later than the 12th inst. stated "his conviction that oil wells *must* be found in the places whence these samples come."

L. W. Bailey, present Professor of Chemistry in the University of New Brunswick, in his official report, published 1864, says on page 69 :

"Westmoreland County, Dorchester.—On Ayers' farm, Petitcodiac, asphaltum—petroleum springs. On Goodie's farm, 'maltha.'"

At page 62 of same report :

"I have only to add, that oil has recently been discovered on a slip of land between the Memramcook and Petitcodiac in Dorchester (the Company's property). It is found floating upon the surface of a stream, when, upon exposure to the air, it hardens into a sort of pitch. I believe in the existence of oil wells. It might be profitable to undertake experiments wherever the substance termed *maltha* is found in quantity."

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